frequencies) in an engine plume, they do not detect the fluctuation frequency of a signal.

That is, the Hill reference, e.g., in cols. 5 & 6, can detect spectral frequency differences, i.e., can distinguish the sodium spectrum line from the potassium spectrum line, as indicated in Hill in col. 6, lines 33-46.

However, since neither Hill nor Hasson suggest the use of a lock-in amplifier, they cannot detect fluctuation frequency differences between, say, a sodium lamp that fluctuates at 60 hertz and sodium in a rocket plume that fluctuates at, e.g., 50 hertz.

That is, spectral frequency relates to a color line of an element in the spectrum while a sodium lamp, powered by 60 hertz AC, will fluctuate at 60 hertz. Thus, with a lock-in amplifier set at 50 hertz, one can distinguish between the above two sodium emissions and see only that which fluctuates at 50 hertz while screening out nearby sodium street lamps.

In contrast, the Hill system in looking at the two sodium emissions, would just show a sodium spectrum line and one could not tell whether one was looking at a street lamp, a sodium plume or both.

While Hill mentions the word "amplified" (or a variation) three times in cols. 4, 5 & 6, as noted in the Office Action, such amplification is different from that produced in a lock-in amplifier which can take a series of snapshots of a varying signal for a temporal view thereof to see one sodium signal and not the other, as described above.

The prior Art does not have this dual filtering system and cannot distinguish one sodium emission from another of a different fluctuating frequency, as discussed above.

Even the Hill Abstract refers only to spectral frequencies.

Thus applicants, per claim 1, employ a) a plume detector which includes an

electro-optical sensor for detecting narrowband spectral emissions and b) a lock-in amplifier to reduce background radiation for more accurate detection of, e.g., a sodium plume while ignoring sodium street lamps, though both have the same spectral emission line.

Accordingly, claim 1 and its dependent claims are believed distinguished over the applied references by applicants' two-way or dual filtering plume detection system, as compared with the one way spectral emissions plume detection system of the prior art.

Likewise, applicants' dependent claims, 2-15 are believed distinguished over the above applied references in view of their dependence from claim 1, which is believed novel thereover, as discussed above.

In view of the foregoing, the claims of record, are believed distinguished over the applied references and in condition for allowance.

In accordance with Section 714.01 of the M.P.E.P., the following information is presented in the event that a call may be deemed desirable by the Examiner: Thomas C. Stover, (781) 377-3779.

Respectfully submitted,

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